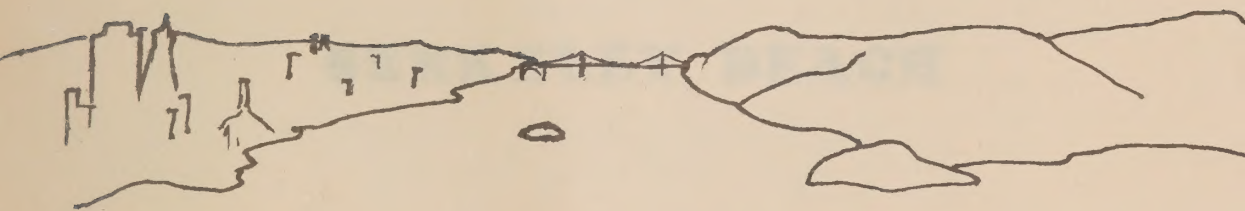


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**BERKELEY
BEACH**

A STUDY BY CURT MANNING FOR

(c) 1980 THE BERKELEY BEACH COMMITTEE

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**THE
RECONSTRUCTION
OF
BERKELEY BEACH**

An initial study by Curt Manning
for the Berkeley Beach Committee



We wish to thank Norris Millikin of the San Francisco Bay Conservation and Development Commission (BCDC), and James C. Wolfe, of the U. S. Army Corps of Engineers, for their helpful suggestions on a draft of this proposal submitted to them.

Also of great assistance was Dean Macris of the Association of Bay Area Governments (ABAG). In addition, we wish to thank Urban Care and the Berkeley Bayfront Council for their encouragement and support, and particularly Mrs. Rosalyn Lepawsky for her active participation in the planning of this proposal.

Finally, we are deeply indebted to the historical work of Stephanie Manning which inspired the vision that this proposal represents.

A more inclusive reference list appears at the conclusion of this publication.

- The Berkeley Beach Committee

December, 1979

FOREWARD

Many are now realizing the potential of West Berkeley to be a beautiful asset to the rest of the city. The proposed restoration of old Delaware Street is but one of the city projects that exemplify this new awareness. Furthermore, the restoration of Berkeley's beach for the enjoyment of all should be an integral part of the ongoing rehabilitation of West Berkeley. In a recent letter from James C. Wolfe, Acting Chief of the Engineering Division of the U. S. Army Corps of Engineers, Mr. Wolfe makes it clear that viable beaches are both rare and welcome. He says, "Few recreation beaches exist in San Francisco Bay, and any additional beach will be an asset to the region and the Berkeley Community."

The results of a study of the Berkeley waterfront has shown that the only viable beach location is between University and Ashby Avenues. North of the landfill, the site of the original beach, the coast is sheltered from tidal action coming through the Golden Gate and from westerly winds by the North Dike landfill (See maps pgs. 3 and 4.). Further, there is bad circulation in this body of water - a situation more conducive to the raising of oysters than for swimming.

But the area between the Berkeley and Emeryville Marinas has ocean and wind generated waves as well as an adequate circulation. A more detailed study of this area is the subject of this proposal.

Our purpose in writing this report is to propose the repair of environmental damage in West Berkeley. It seeks the repair of the coast with a minimum amount of money spent. It does not envision the great parking lots and concession stands associated with Southern California beaches, although this may be considered if the area is to be regarded as a regional attraction. It does, however, foresee more beach area and public access. We feel it is our responsibility to protect and enhance such natural areas for the enjoyment of anybody.

BEACH HISTORY

The Berkeley Beach that existed up to the mid-twentieth century was a fortuitous result of wind, tide and littoral flow on the shore. Sand was washed up on shore at a natural bowl formed by the cliff at University Avenue and Fleming's Point, nearly a mile north. Fleming's Point is an outcropping which was separated from land by a salt marsh through which drained Schoolhouse and Codornices Creeks. Fleming's Point is the only shoreline whose present contours match the original beach.

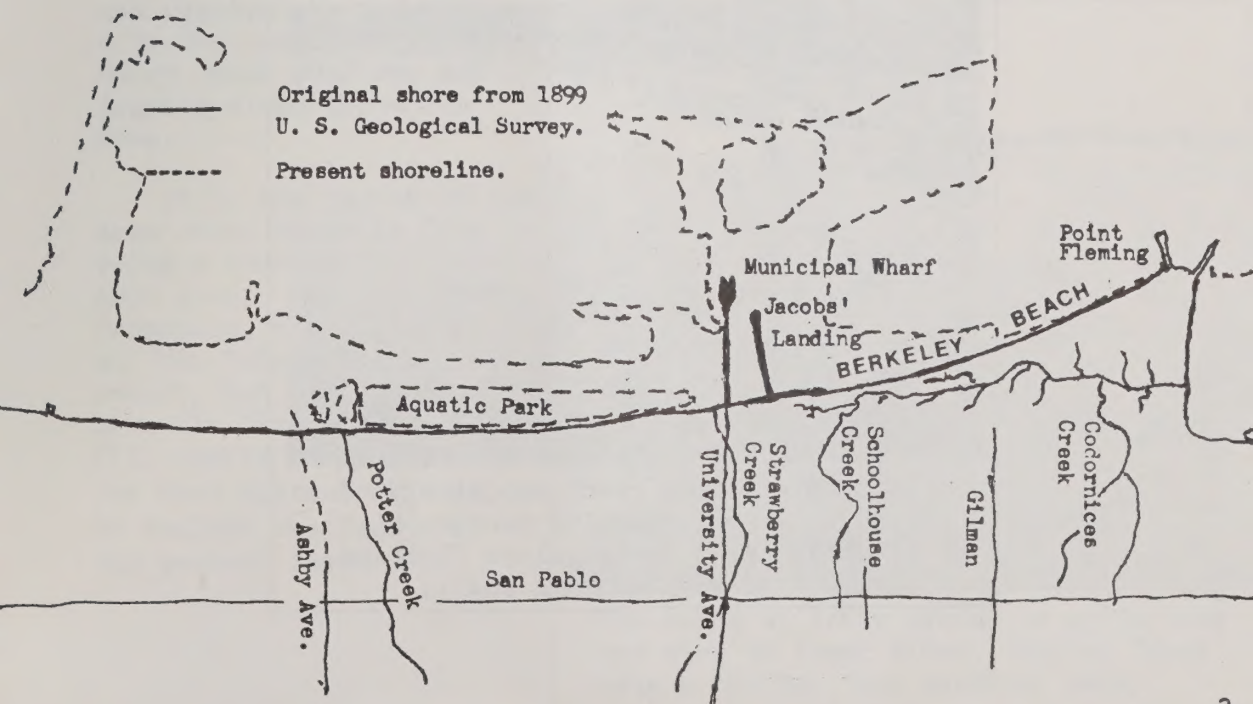


Mrs. Moisan and her children enjoy the beach in 1908. Notice the salt marsh and Albany Hill. Photo courtesy of Louis Stein.

This beach was an integral part of the bustling town of Ocean View even after the Southern Pacific Railroad came through in 1876. Hotels were built at the foot of University Avenue on either side of the tracks within a block of the beach. The beach was popular with residents and drew many visitors in the heyday of Ocean View. Captain Jacob's Delaware St. pier, built in 1853, and the Municipal Wharf, 1875, (shown in map below) provided a natural focus for the town.

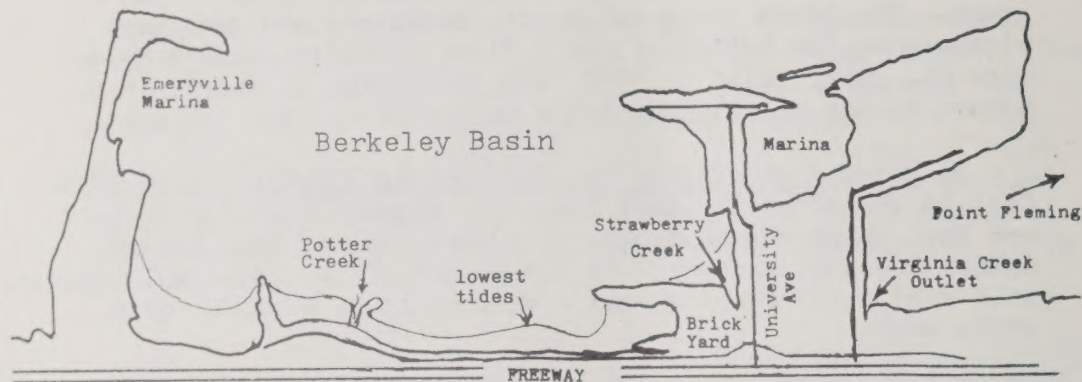
In Heywood and Jacobs vs. The Municipal Ferry Co. in 1875, Captain Jacobs stated that there was a great quantity of sand and that there was no danger of running out of it. Indeed, Samuel Heywood, according to the memory of the late Paul Spenger, sold sand at 50 cents a load - whether it be a cupful or a whole wagon.

The Depression, however, brought the WPA which in turn brought the construction of the road forming Aquatic Park at the Bay's edge. Sand from Berkeley Beach was used in this and other projects. Finally it was either sold, dumped, or covered by landfill.



AS IT IS TODAY

a West Berkeley Waterfront



Strawberry Creek Beach has plenty of sand, but much floating debris is trapped. Also, beach slope flattens abruptly as wave size is small.

MODERN HISTORY

As one becomes aware of this history, the magnitude of the loss becomes apparent. Recent hearings by the Berkeley Water-front Advisory Board have made it clear that the City's focus was on boaters. Today, you can sail your boat, if you have one, but you cannot take a leisurely walk on the beach.

Yet there are a few disconnected spots where there is sand. Near Ashby is the most impressive stretch, but it almost disappears at high tide. At the north end of that stretch, near University Ave. is a small sandy beach, and there is another at the mouth of Strawberry Creek (see map page 4) which is perhaps forty meters wide and fifteen meters deep with accumulated sand.

All of these beaches are below our expectations for really useable beaches. Strawberry Creek beach perhaps best expresses, in constrained fashion, the original beach - with its gentle curve and native plants sprouting in the dried sand.

Current uses of the area include fishing from Frontage Rd., boating in the Sailing Basin (here, Berkeley Basin), walking, dog running on Ashby Beach, informal vending of fish, fruit and vegetables at University Ave. near the Strawberry Creek outflow, and jogging along the whole area.

It is the layout of the area which keeps it from being a thoroughly enjoyable area. The view of San Francisco, the Golden Gate and Mt. Tamalpais are superb, but the unsympathetic lines of the landfill spoils the picture. The next section will help us analyze the faults of the present layout.

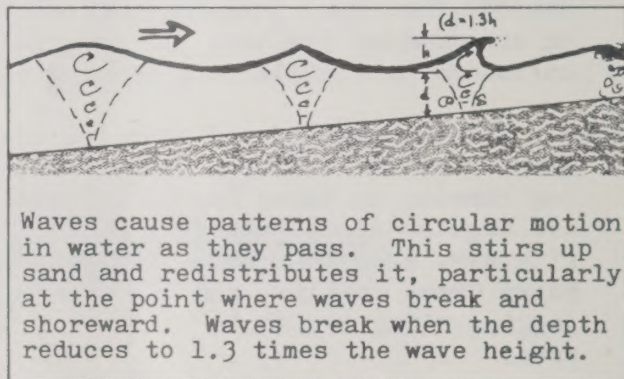


The beach at Ashby Avenue is quite long and nice at lower tides. Potter Creek enters the Bay just south of here, behind the photographer.

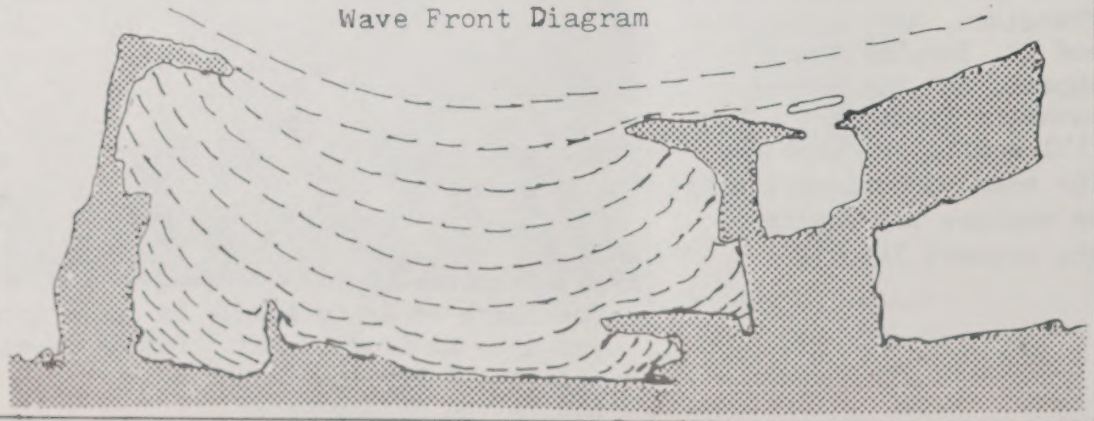
BERKELEY BEACH IN THEORY

The major force involved in the formation of beaches is wave action. Characteristically, waves travel in wave fronts which are analogous to light waves. They have different velocities in different mediums. Materials of high refractive index slow the measured velocity of light in the medium and refracts it. Ocean waves are refracted by variations in the depth of water they occupy. If a wave front were to approach the southwestern edge of the Berkeley Marina, the Bay floor being shallower close to shore, the wave slows there and subsequently bends around the point and enters the Basin.

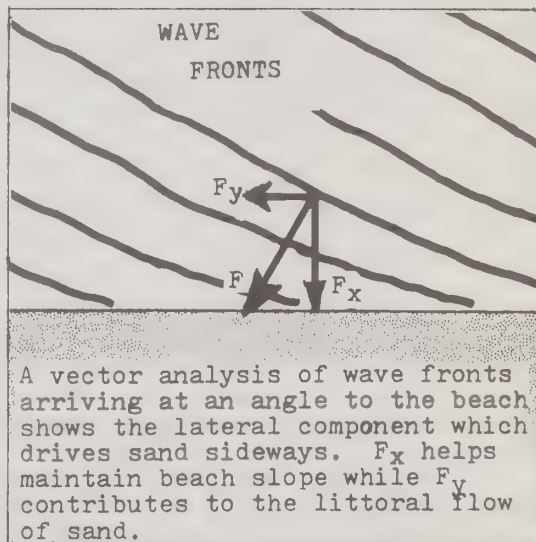
As waves pass over the Bay floor, they cause minute ebbing and flowing, stirring up debris, and releasing its potential and kinetic energy, particularly at the point where they break and shoreward. Waves rise up and 'break' as they approach the shore. They break when the depth of water reduces to roughly 1.3 times the height of the wave. It is the turbulent action of a breaking wave which pushes sand shoreward. Also, lighter material such as silt is suspended and carried away thus cleaning the sand. Thus, the size of the waves arriving in the proximity of the beach determines from how far out sand will be moved and moulded by tidal action.



Wave Front Diagram

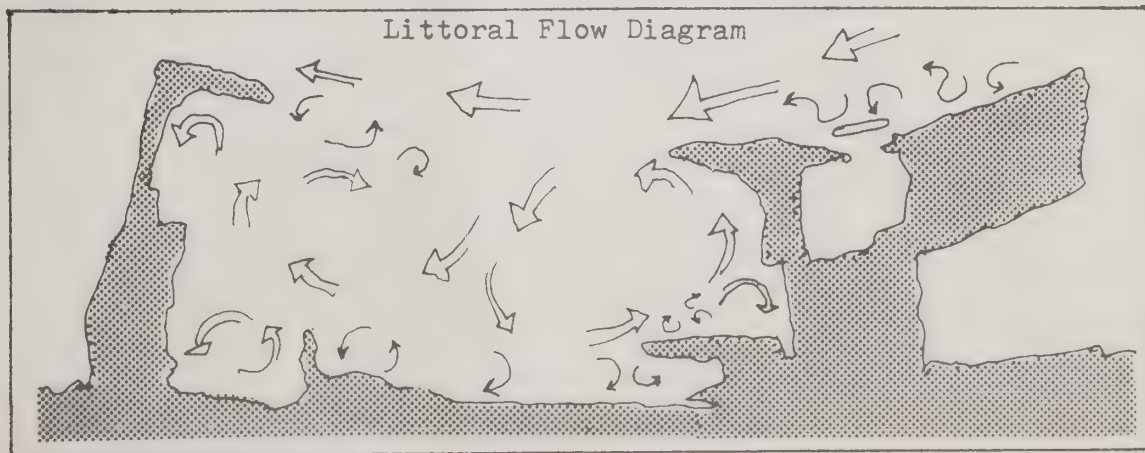


In what manner wave fronts are refracted is determined by the contours of the Basin floor. This has much to do with the angle at which the waves strike any particular part of the shore. This, in turn, determines the direction the sand is pushed. In the map on page 6, which shows the area as it is at present, waves do not in general land straight on the beach, but at an angle, which causes sand to be pushed sideways into pockets. In the map (page 10), of the proposed beach, wave fronts arrive at the beach at the same time, and at right angles where stable beach is contemplated.



Waves, however, are not the only factor determining the equilibrium state of the Basin shoreline. The currents in the Bay coming from tidal currents and the flow of the Sacramento River induce currents and some of its suspended matter into the Basin. At

points where there are slow stable currents, debris will settle. This accumulation of debris effects the contours of the Basin floor, and the energy and direction with which waves arrive



at the shore. It is not considered very likeley that sand is being deposited in any considerable quantities within the basin from the littoral flow of the Bay. Most of the sand contributed by the Sacramento River is deposited at Southhampton Shoals near Point Richmond. The sand existing now at the Berkeley site may have been the residue of sand pumped years ago in the building of the freeway. However, some of the sand may have been contributed by Potter Creek which empties near Ashby Ave. The sand from Strawberry Creek is trapped where it enters the basin.

A third important factor is wind. In the case of the proposed beach, the wind direction is in substantial agreement with the direction of waves coming through the Golden Gate. Thus, wind adds its force to the waves, helping to form and maintain a clean beach.

The shape of the beach is substantially caused by the Pacific ocean waves which enter the Bay through the Golden Gate. The contours of the basin mould the wave fronts into an arc which arrive and break almost simultaneously over the stretch of natural shoreline (where the boulders of the land-fill do not project into the water). Wind caused waves may alter the resultant force acting on the beach. When the wind comes from the left of the line between Berkeley and the Golden Gate, sand is nudged northward. When wind comes from the north of our imaginary line, sand is pushed south, and sometimes around the bend at the Ashby Ave. freeway onramp. The Ashby Ave. area is of prime concern to us, and will be addressed in the next section.

PLANNING THE BEACH

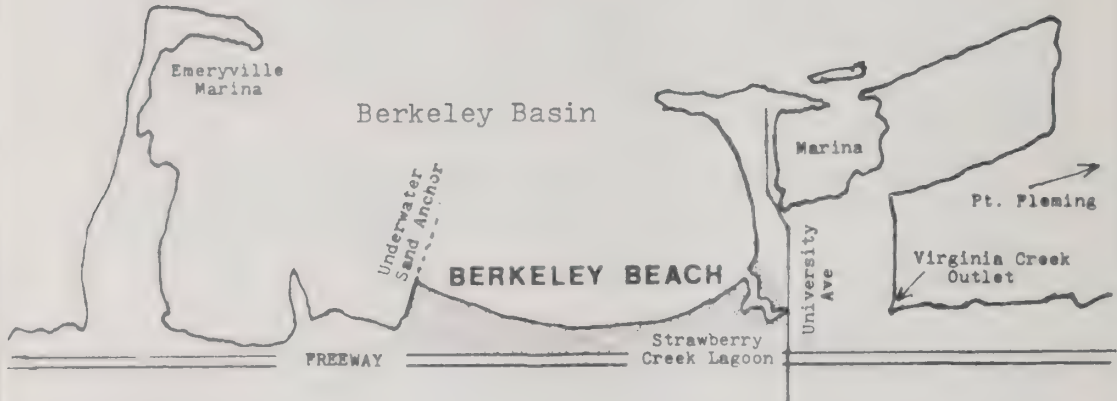
In planning the beach, one must stay within the range of current fiscal constraints, and let nature do what it can. We have seen some of the problems of the current situation and have consulted the science of waves and beaches. Now it is time to propose specific solutions. The problem areas can be listed as follows:

1. The Brick Yard - It cuts off Strawberry Creek from the main area, and thus cuts off the main source of sand. It also creates dead water east of the southerly projection where foul mud accumulates.
2. The Ashby Ave. area - Refracted wave fronts push sand around the corner into Emeryville, so the beach remains small. It is seen that a sand bar caused by the outflow of Potter Creek is the main cause of this refraction, so that at high tides sand is washed behind the bar and around the corner.
3. Pedestrian and bicycle access is woefully inadequate. The access afforded by the University Ave. overpass is unpleasant and more suited to the very brave.
4. Sound emanating from the freeway - when one is on the beach at Ashby, one is substantially protected from the sound by the height of the landfill there. However, if the beach is to be widened, the freeway sound can again reach the ears, and this competes with the mood of the beach. The solution to this problem will also solve the anticipated problem of blowing sand.
5. The need for sand - While the Berkeley Beach Committee anticipates that the beach will be replenished by sand supplied from Strawberry and Potter Creeks, there is doubt on the part of some consulted that there is sufficient sand produced in this manner. In this case, we could take advantage of Federal funds for annual replenishment of sand. We feel, however, that since the original beach was stable, there is no reason why this beach could not be designed to be self sustaining. However in the initial widening of the beach, imported sand may be necessary to hasten the balance of forces.

(Continued on page 11)

PROPOSED BEACH

Principal Features



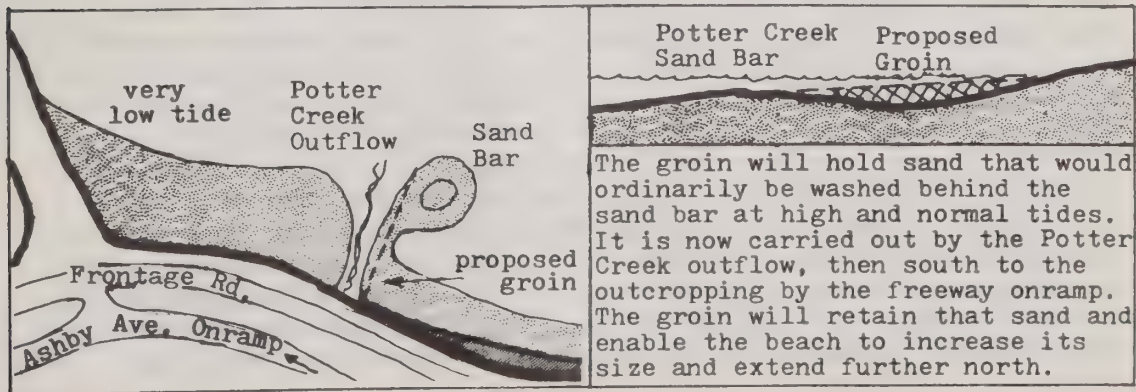
Wave Front Diagram



Compared to the beach as it is at present, page 4, the Proposed beach adds fill to the Ashby Ave. area in order to widen the beach so that a continuous beach will exist from Potter Creek at Ashby to Strawberry Creek at University Ave. An analysis of the contours of Berkeley Basin must be made in order to determine what the final equilibrium shape of the beach would be.

1. Brick Yard (see map pg. 4) - The Santa Fe Land Improvement Co. owns this land and has leased it to Knapp Excavators. They have been granted a variance to store fill on this land which was originally planned to be a rail line, parallel but west of the freeway. The shape of this fill constitutes a blight on the area, and should be rearranged so that Strawberry Creek may contribute its sand (which is substantial) to the beach, and so that the beach has a smooth profile similar to the original beach, and consistent with good beach theory. Perhaps a lagoon could be created with native plants once the problem of pollution of the storm drain water is solved. The problem is that all the cans, bottles and oil filters wash down with the water. A rotating screen could catch the debris and dump it on a conveyor belt that is activated by weight.

2. The Ashby Avenue area - To allow the smooth, continuous curvature a stable beach requires, some adjustment must be made at the southern boundary of the proposed beach. The outflow of Potter Creek creates a sand bar perhaps fifteen meters out from the usual shore. At neap tides (very low tides) it is clearly visible. The low spot shoreward allows wave action to push sand behind the bar and southward where it collects at a small landfill. To keep sand from being washed around the corner, a wall must be constructed. I call it a sand anchor, but it is known technically as a groin. It would serve the same purpose that the rocks at Fleming's Point did in the original beach. It served as an anchor for the sand bar that formed the beach. The groin would trap sand, but lighter silt and floating debris would be washed south when winds came from the north. The groin would extend the beach fifteen meters or more.

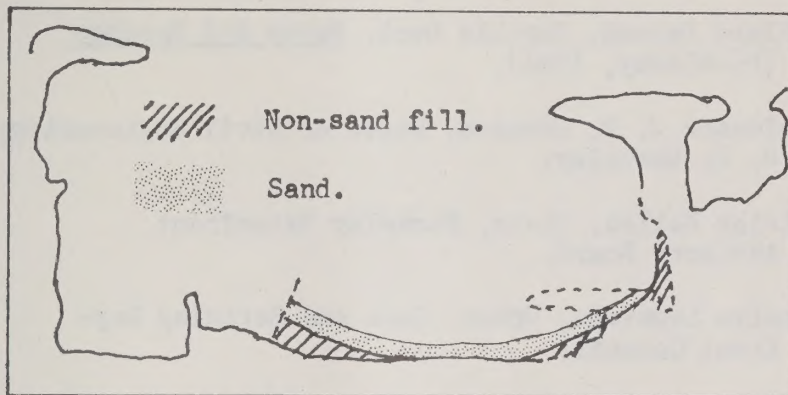


3. Pedestrian and bicycle access - Many residents of West Berkeley would appreciate a way to get to the beach without owning a car, or being brave and fleet of foot as is now the case in negotiating the badly planned 'pedestrian access' appended to the University Avenue overpass. A bridge connecting Aquatic Park at Addison St. and the beach (near Strawberry Creek) would satisfy the need for public access, and should properly be a part of any Berkeley Beach proposal. Such a pedestrian bridge has been in the works of Caltrans for many years, and now appears to be hung up by a proposed widening of the Freeway by the addition of a diamond lane to both north and south traffic. The process is expected to take eight years - too long, we feel, to wait for adequate public access. At the same time, we feel that the widening of the Freeway, just at the time that we are contemplating the imminent drastic reduction of personal automobile use, is absurd. In view of this, and the historical use of the Southern Pacific tracks as a commute line (with stations first at Delaware St. then at University - now China Station restaurant) we would suggest that rail transport be the favored manner in which to reduce Freeway traffic.

4. Freeway noise - Noise and the possibility of blowing sand can be dealt with by the construction of a masonry wall low enough to allow freeway drivers their view, but high enough to protect people on the beach from the direct blast of the noise. Where the beach is wider, a taller wall will be needed, but in the middle, where the beach is narrowest, only a very low wall need be constructed. It is not yet clear whether this wall should be between the beach and Frontage Rd. or Frontage Rd. and the Freeway. It is a question of whether one wishes to allow fishing from one's car as is now the case.

5. The need for sand - Strawberry Creek, while it supplies some sand, does not supply enough sand to regenerate the beach very fast. Once the land of the Brick Yard has been recontoured to comply with the plan, and the groin has been installed at Ashby Ave., there will be a substantial amount of sand needed. If we were to save the Strawberry Creek sand, and send it through selves, and save the Ashby Beach sand, then move dirt in behind it and re-apply the sand at that shore, the sand would go farther. However, it may not be advisable to use much non-sand fill because the shifting beach shape as seasons change may expose the dirty fill. Therefore, it seems wise to import a one time bulk of sand (we are currently lacking the estimate) to establish the beach at close to equilibrium state from the

beginning. The other alternative is gradually increasing the extent of the groin as the beach accumulates sand from creeks. The sudden addition of a long groin would trap too much debris in its cove. Perhaps a moderate amount of non-sand fill could be transported from the Brick Yard site to the Ashby Ave. site, forming a small parking lot. This would leave room for the addition of sand along the whole extent of the shore.



Obviously this stage of the planning is quite beyond our ability, as a committee of citizens, to engineer. Some professional help should be brought in. John Sustar, staff Engineer for the U. S. Army Corps of Engineers, in a personal conversation with the author, said that if the city of Berkeley were to express its interest in the project, and inquire of the Corps, it could spend perhaps a week working in the area. We expect that their help would answer all of the technical questions the governing body may require before making a decision of whether to go ahead with the project.

The financial component of this proposal will become clear when it is known which governmental entities will take responsibility. If the beach is conceived as a regional attraction, perhaps East Bay Regional Parks should fund it through the County. If it is to be Berkeley's beach, then there are available matching HUD grants for rehabilitation of deteriorated recreational systems in distressed areas. If it is seen that this applies to West Berkeley, such a grant could be channeled by the local government to community based, private, non-profit groups, such as Urban Care of Berkeley.

The following people have provided help and information which contributed to this Proposal. We are indebted to:

Willard Bascom, for his book, Waves and Beaches (Doubleday, 1964).

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Norris Millikin, Engineer, Bay Conservation and Development Commission (BCDC).

Charles Roberts, Berkeley Marina Office.

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